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phosis of the Nauplius into a pupa and subsequently into an animal of a sessile and immobile habit of life; second, it is due to parasitism (Symbiosis). An approximate stability of the present form of *Sacculina* is maintained by the important law of heredity, very slow changes in color, form, etc., will, however, make their appearance by changes of climate and immediate surroundings, *i. e.*, the host. In concluding, let me quote from E. Haeckel: "The series of forms which the individual organism passes from the egg up to the development of the adult form is but a brief and rapid recapitulation of the series of forms, which all the ancestors of this organism have passed since the beginning of the organic history of the earth down to the present day. This repetition or recapitulation is conditioned through the laws of heredity and modified through the laws of adaptation. The historical record, preserved in the developmental history of the individual, is rendered gradually obliterate, the development gradually taking a more and more direct course from the egg up to the adult, and it is also often falsified through the struggle for existence which the free-living young are subject to. The falsification of the ontogenetic product is conditioned through the law of the modified or falsified heredity."

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MEN IGNORANT OF FIRE.

BY TITIAN R. PEALE.

IN theory, mankind differs from all other animals in the habit of cooking his food by the means of *fire*, which, in the progress of civilization, has improved so much as to become a science. Hence there are many grades of progress to be observed between the savage and the civilized man; and hence there are many facts worthy of record by the intelligent traveler, relative to the use of fire. I do not know of any but a single record where natives of a *newly* discovered country did not know the *use of fire*; that one case was on Island *Fanua Loa*, or Bowditch's island, discovered on the 29th of January, 1841, by the U. S. S. *Peacock*, commanded by Capt. W. H. Hudson, of the U. S. South Sea Surveying and Exploring Expedition (see Narrative by Ch. Wilkes, Vol. v, p. 10).

Captain Hudson relates: "The natives were at first very shy of the boats; but the Hawaiians who were in them soon induced them to approach, and to enter into trade, and finally enticed

them alongside the ships. On coming near they began a song or chant, holding up their paddles and mats, and shouting, 'kaflou tamatau.' They resembled the natives of Oatafu, or Duke of York's island, wore the same kind of mats, eye-shades and ornaments, and some were tatooed in the same manner. Some, however, were tatooed in a different style, being ornamented with a variety of arrows on the forehead and cheeks. They were all finely formed and manly in appearance, with pleasing countenances that expressed good nature.

"They were eager enough for trade, and soon disposed of all they had to exchange; a few presents were made them, but all inducements failed to entice them on board. They appeared cheerful, laughing heartily at anything that struck them as ridiculous. * * * * *

"The population of this island is estimated to be about six hundred souls, most of whom dwell in the town.

"There were no signs of places for cooking, nor any appearance of fire, and it is believed that all their provisions are eaten raw. What strengthened this opinion was the alarm the natives felt when they saw the sparks emanating from the flint and steel, and the emission of smoke from the mouths of those who were smoking cigars."

The writer of this article was on board the *Peacock*, and can vouch for the verity of Captain Hudson's account of our interviews with the natives, and also that they eat their entire food without cooking, but also had the greatest dread of fire in any form. We saw no traces of charcoal or ashes in their village or town, and we fully understood them as to their food, and how it was taken. It consisted entirely of cocoanuts and pandanus fruits; fish, echini, and other products of the sea; the few sea birds mostly seen there, were not regarded as food, and even if they were, could not have been easily obtained or relied on for supplies, the population being large in proportion to the island's size.

In many of the semi-civilized islands of the Pacific ocean uncooked fish are still eaten as a delicacy; also echini, or sea eggs, as we eat oysters, raw, or "in the shell."

The terror of fire, as we witnessed it on more than one occasion at Bowditch's island, convinced us fully that down to the period of our visit the natives had never cooked their food; fuel was not abundant on any of the coral islands or attols, and fish were plenty and relished when not cooked. We saw a kind of half cooking at the Paumotu archipelago of fish, to preserve them for transportation to the Island of Tahiti.

The natives of Fanua Loa, when discovered, were quite ingenious in the construction of houses, canoes, and various fishing implements, mats, &c., considering the total absence of all metals, their island being of coral formation, and their having no communication with any other.

The various boxes, bowls, stools, &c., carved from the solid wood with sharks' teeth, and smoothed with coral and shark-skin files, were obtained and brought home, and formed a part of the nucleus of the National Museum in the Smithsonian Institution at Washington, where they now hold a place in the Ethnological Department; but, strange as it may appear, some wag, more learned than wise, wrote on a box containing fishing implements the words, "Tinder box," to contradict the statement by Captain Hudson, in Wilkes' published journal—a practical joke, no doubt, but one that should never have been tolerated by those in charge of the public specimens in a national museum.

That cold meals agreed with the Fanua Loans was evidenced by their appearance—they were a handsome people. When we visited them in January, 1841, they were living anterior to their "stone age;" no one of them, it is probable, had ever seen a stone, or a stone implement of any kind; the smallest stone to them would have been as great a curiosity as a *coral tree* would be to a Dakota Indian on our prairies! Their hardest edge tools were made of sharks' teeth or chama shells, yet their carving was not bad; their canoes, stools and boxes, &c., were neatly smoothed with sharks' skins on wooden handles, forming rasps of various shapes to suit the work to be done. They had a well, and a sea wall built of coral rock.

We obtained from them very neatly plaited rush mats used for clothing, &c., but saw no tapa or bark cloth, so common on the volcanic islands of the Pacific ocean.

The thunder of our cannon, when measuring the island by sound, when explained to them, did not create half the alarm created by a lighted cigar, which in their understanding could not bear any explanation, and no persuasion on either of our visits could induce them to approach it.

Now, after forty-two years, and when foreign missionaries have dwelt there, this plain statement of a little fact about fire, will perhaps be as new at Fanua Loa as similar facts will be about cannibalism on other islands where they have been taught to con-

sider it disgraceful to their ancestry. But facts are always of interest in the history of any people, however civilized they may become.

The natives of most of the Polynesian islands, I believe, are willing and capable of the highest grade of improvement in civilization, under proper treatment by nations of greater power and higher mental attainment.

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GRAVE MOUNDS IN NORTH CAROLINA AND EAST TENNESSEE.

BY DR. CYRUS THOMAS.

BELIEVING that the description of a new class of grave mounds, recently found in North Carolina and East Tennessee, may be of interest to the readers of the *AMERICAN NATURALIST*, I send, by permission of the chief of the Bureau of Ethnology, the following extract from my report of the mound explorations of the past season.

"The Nelson Mound."—This mound, so insignificant in outward appearance as scarcely to attract any notice, was located (for it no longer exists) on the farm of Rev. T. F. Nelson, in Caldwell county, N. C., on the bottom land of the Yadkin, about one hundred yards from the river bank. It was almost a true circle in outline, thirty-eight feet in diameter, but not exceeding at any point eighteen inches in height. The thorough excavation made revealed the fact that the builders of the mound had first dug a circular pit, with perpendicular margin, to the depth of three feet, and thirty-eight feet in diameter, then deposited their dead in the manner hereafter shown, and afterwards covered them over, raising a slight mound above the pit.

A plan of the pit, drawn at the time (after the removal of the dirt), showing the stone graves and skeletons, is given in Plate VIII.

The walled graves or vaults and altar-shaped mass were built of water-worn boulders and clay or earth merely sufficient to hold them in place.

No. 1, a stone grave or vault standing exactly in the center of the pit. In this case, a small circular hole, a little over three feet in diameter and extending down three feet below the bottom of the large pit, had been dug, the body or skeleton placed perpendicularly upon its feet and the wall built up around it from